

Communications Dashboard

(Control Rooms, Take a Cue from Facebook!),

Chapter 1

2013 IEEE Aerospace
Conference
Big Sky, Montana
March 7, 2013

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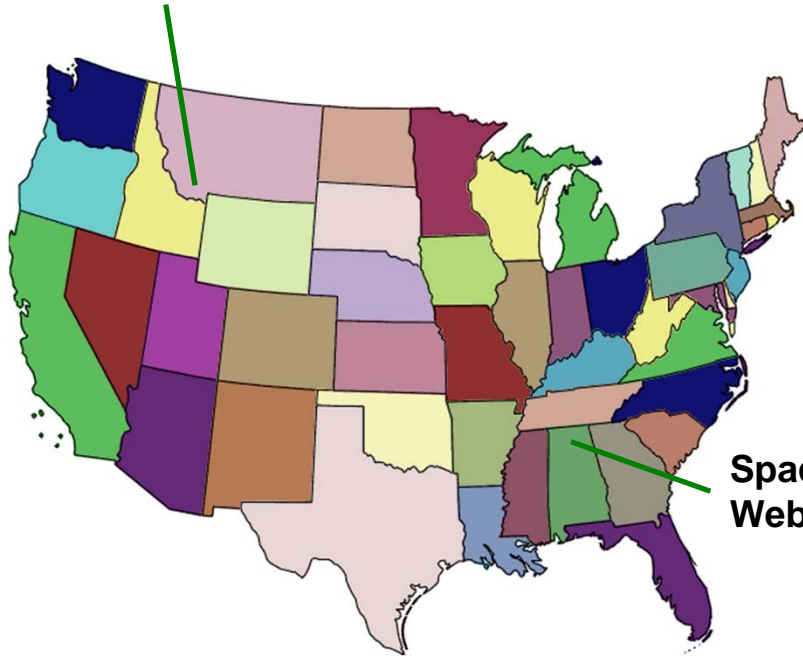
Communications Dashboard



History – A Paper Trail

SpaceOps 2012 - Simplify ISS Flight Controller Communications and Log Keeping via Social Tools and Techniques

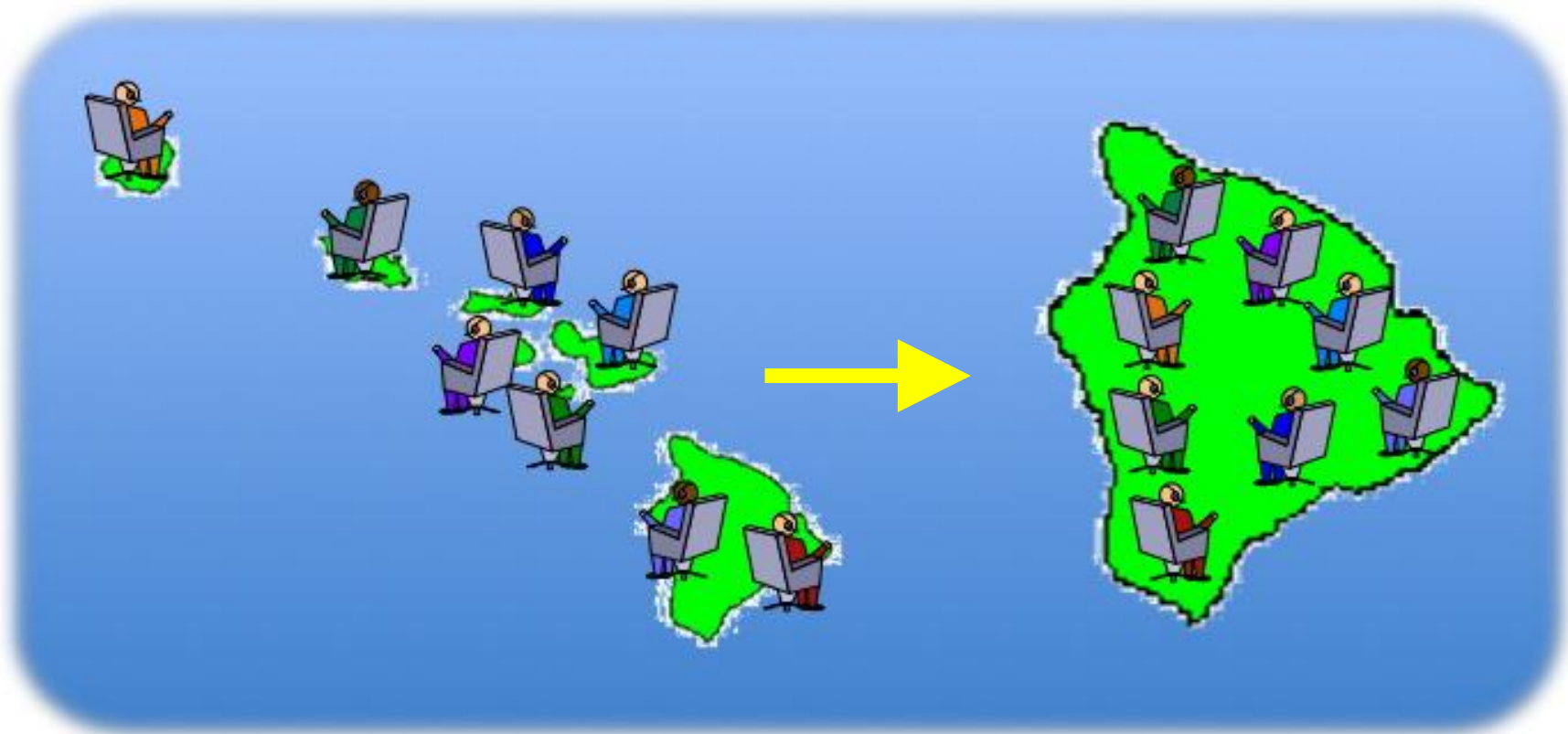
2011 IEEE - Using Social Media for Engineering Support and Space Flight Operations Control



**SpaceOps 2010 –
Web 2.0 for Space Flight Control Centers**



Excerpts from: Simplify ISS Flight Controller Communications and Log Keeping via Social Tools and Techniques



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History of Console and Log Layouts (Abridged)



1960s



1980s



1990s



1960s – 1990s



2011

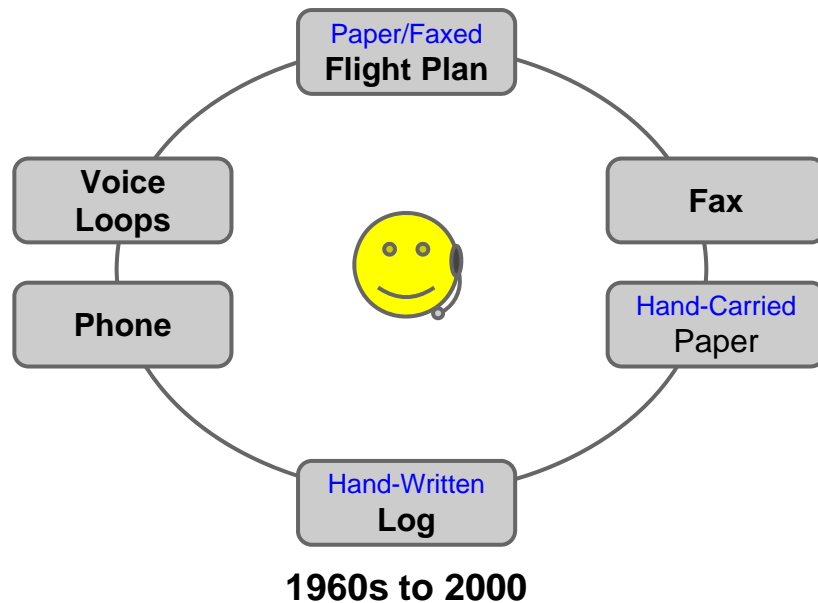


2000s



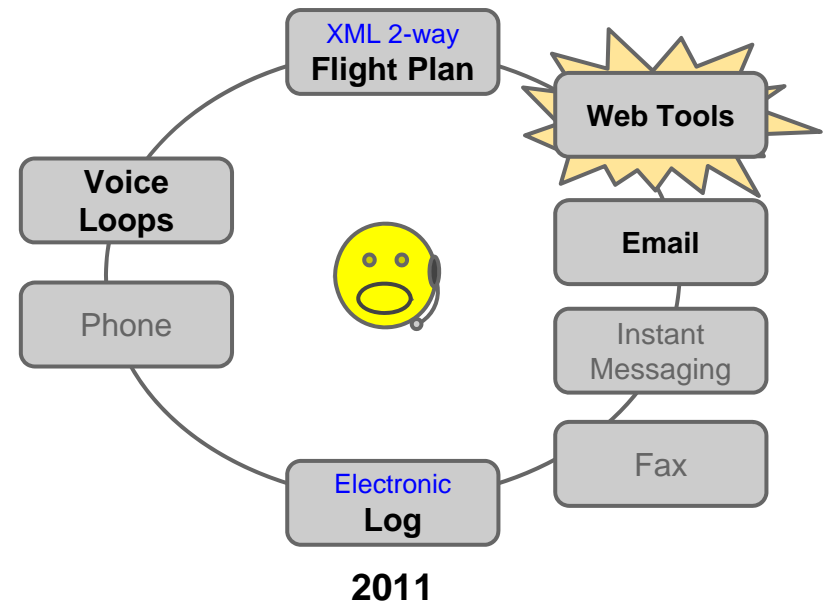
NASA Flight Control Room Communications

(Telemetry not included, remote site interfaces implied but not shown)



Most manned flight operations days to weeks

Agency Front Room Interfaces



24/7 manned flight operations

Agency Front Room Interfaces



Explosion of activities, data, web tools and comm paths

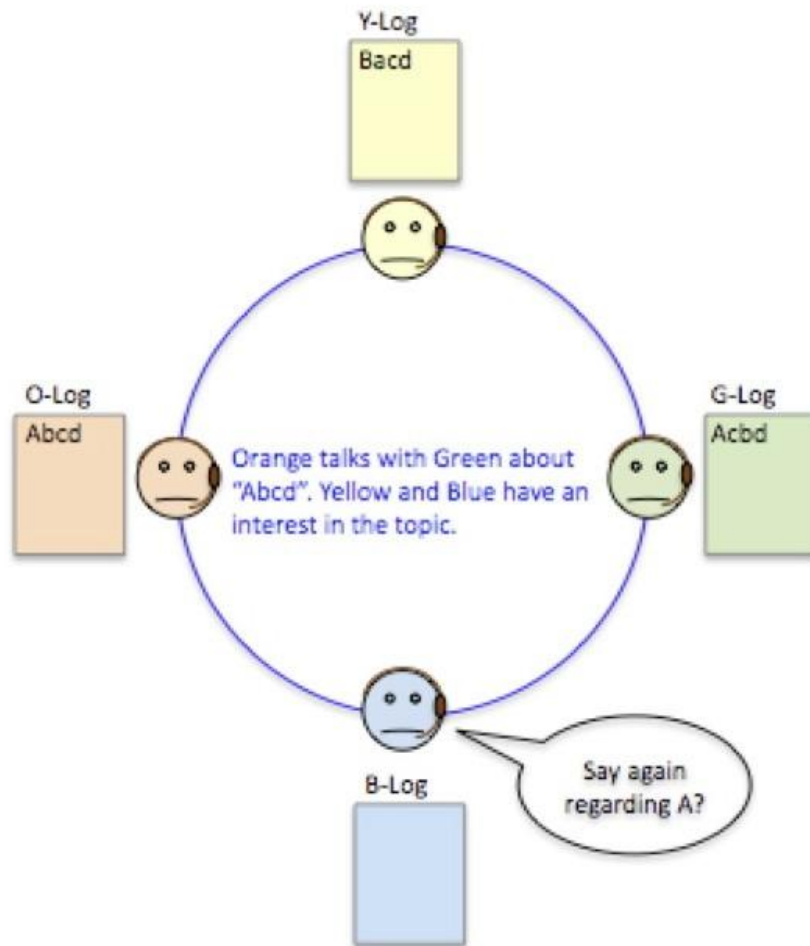


**For 50 years
we've unified information in our heads
or via manual integration.**

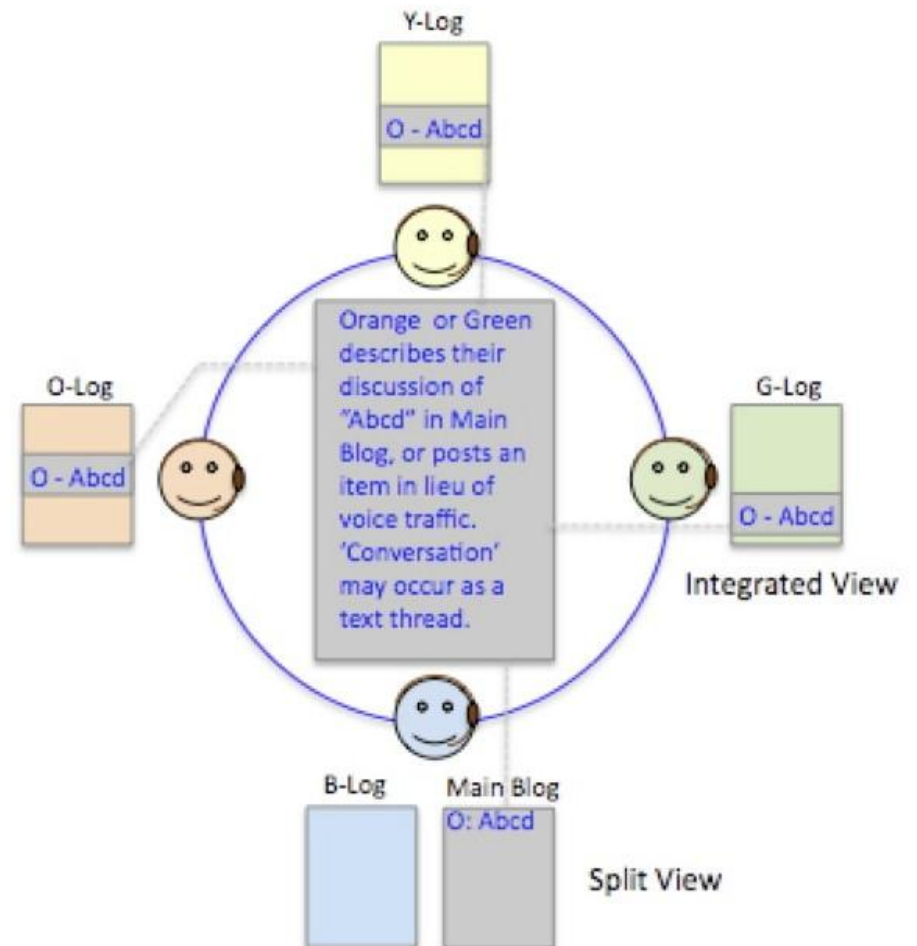
**Why not be nice to our heads with
tools that integrate information intrinsically?**



Isolation -> Divergence

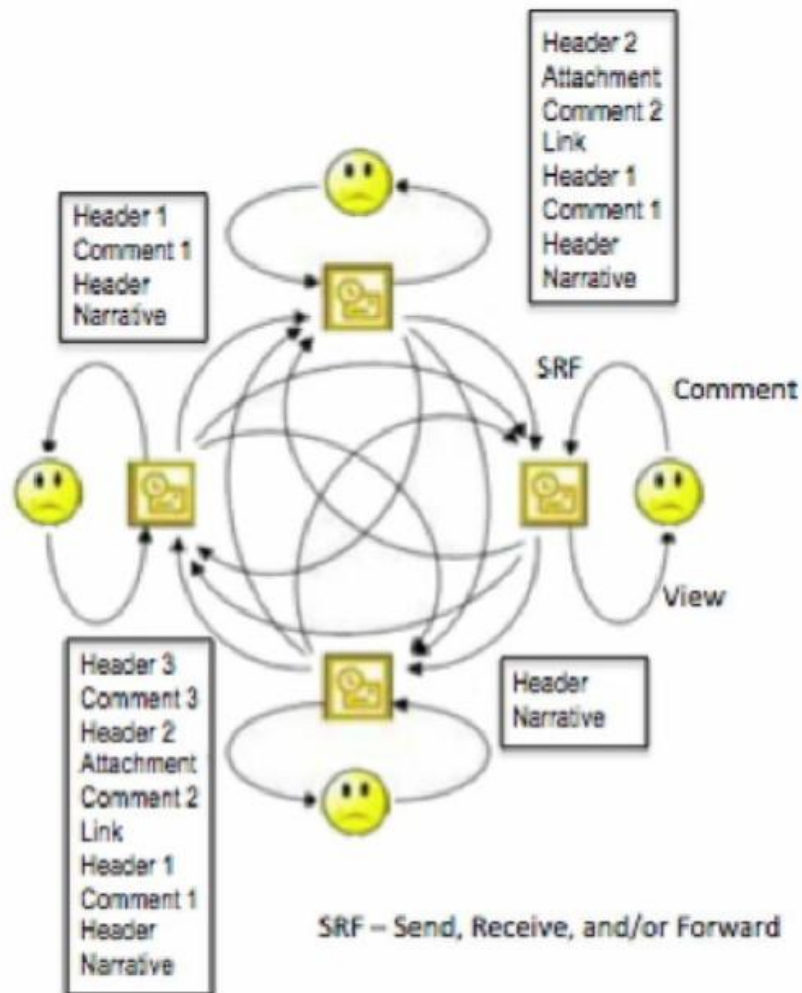


Interleaving -> Sync

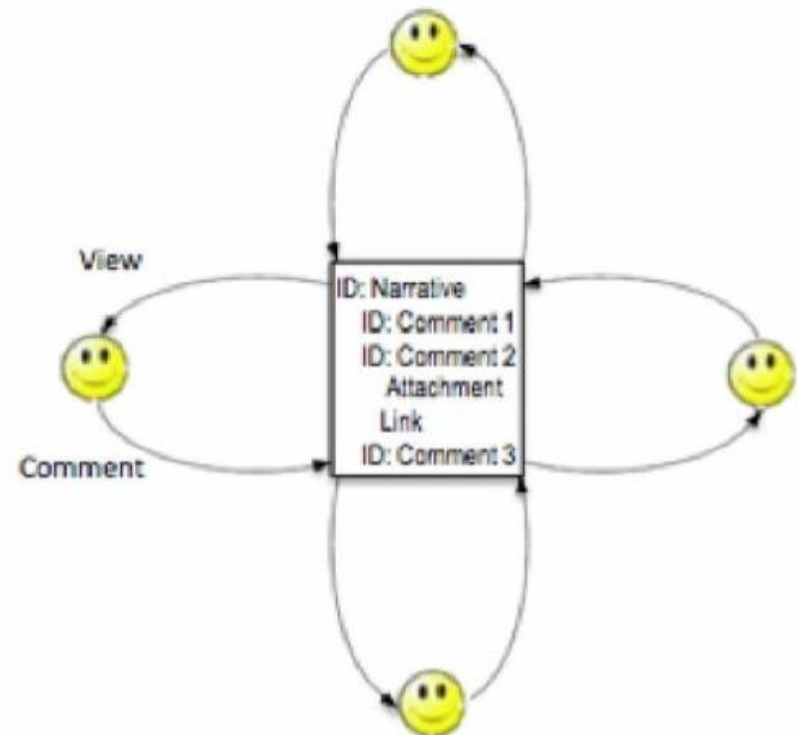


Discover and resolve overlaps and underlaps while they're small!

Lost in headers



Cut the clutter



Emoticon-and-squiggle patterns courtesy of Kevin Jones/MITS-MSFC IS30

Having a single instance of a conversation provides natural focus on "the right stuff."

**Communication tools that cut to
(and preserve a record of)
the chase!**

POIC's Console Log Tool – CoLT

Log ▾ A ⁺ A ⁻ + ✕ [Icons] Notifications ▾ FutureEvents ▾ [Icons]		
Log / Entry:	Cadre Inputs Log / 663578	Title: Primary Log entry
GMT:	2012:116:21:02:07	Shows this entry as being in a primary log with the following entry in a secondary log with entries interleaved in chronological order
Local Time:	2012/116 15:02:10	
Author:	Cowart, Hugh	
Category:		
Flags:		
Future Event Time:		
Payload:		
Log / Entry:	DMC Prep / 663576	Flagged Entry, In this case defined as an item to go in a team weekly report. E-mail is sent to a designated team lead. Category is about a common topic for our team, Future Time is also filled in as the information may pertain to a 'go live date' in the future for a piece of on orbit equipment
Author:	Cowart, Hugh	
Category:	ODAR	
Created Time:	2012/116 20:46:35	
Flags:	Weekly Input - Important	
Future Event Time:	2012/165 00:00:00	
HOSC Time:	2012:116:20:46:32	
Local Time:	2012/116 14:46:35	

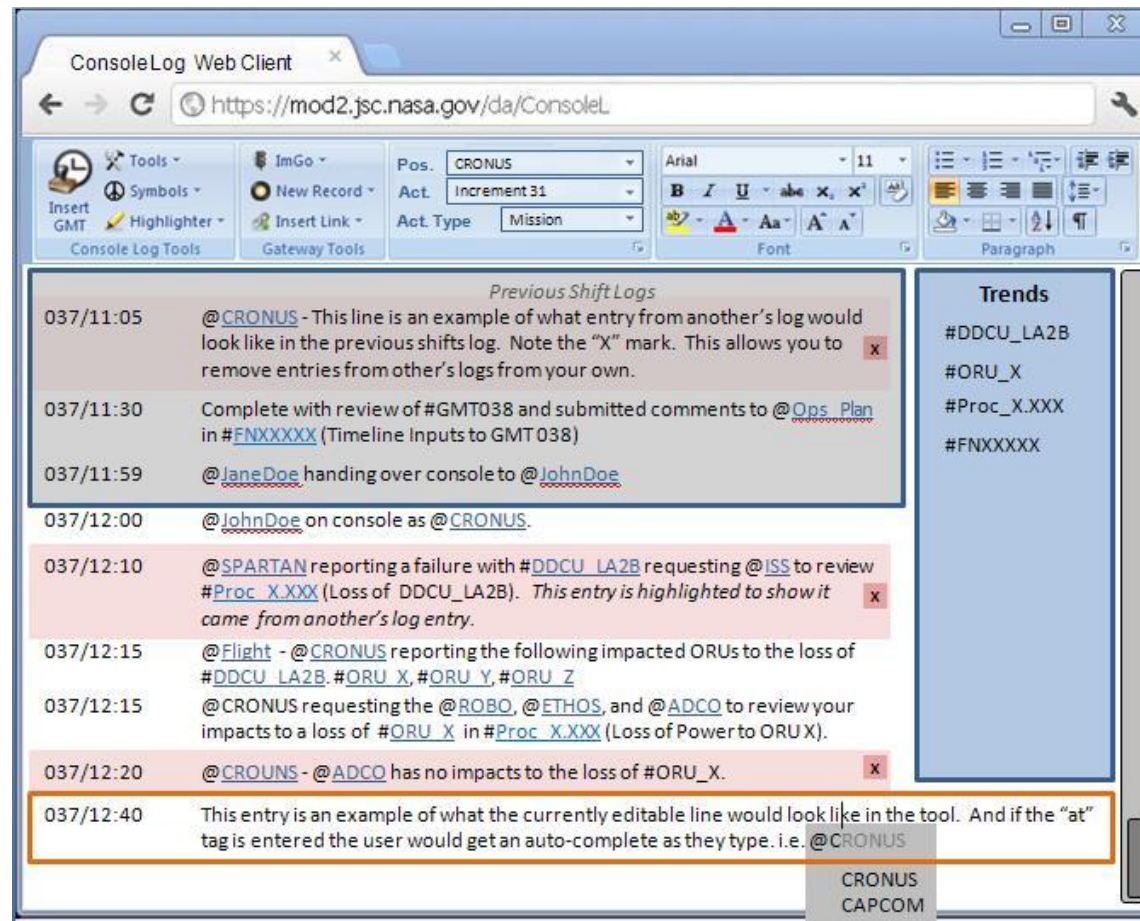
Web-based log provides “anywhere” access and ability to interleave entries from multiple logs

Communications integration (Notifications, Comments, Reports, Subscriptions, Future Events) streamlines information flow among team members

Direct back room participation in log decreases reliance on email (and its chains)

Deployed at MSFC Payload Operations Integration Center –(POIC)

Social Console Log (Concept)



Provides simple but powerful tools for sharing and organizing information

Trend information is useful both in real time and during post event analysis

Auto-complete function keeps consistent target and subject information readily accessible

Console Communications Dashboard (Concept)

1535/POD: Need DPCE inputs 1 hour early!		Ack	Details	Status Scroll
Hailing	PAYCOM Console Log			GMT 201 Day 025
To Fr Where	Day/Time	Loop	Entry	1523: StatusMon ER1 powered on
POD				1527: ExcMon TBD Temp 35.5 High
OC1				1530 – POD/J. Doe Visitors in back!
OC2				
DMC				
PRO1				
PRO2				
LIS				
STOW				
PPM				
POM				
Acknowledge – 1 click Clear – Double-click				
PAYCOM Chat (POIC)		POD Chat (ISS)		Status Panel Ku Until S Until AOS ● 15:43 ○ LOS ○ ● 15:38 Countdown DPC ○ 2:15:20 AFD ○ 7:13:32
025/1432 OC: (From other conversation) 025/1512 PAYCOM:: I think ABC is happening because ... (Interrupted by flight crew call-down) 025/1513 PSE: (While PAYCOM is working crew call) Checked document such-and-so ... (Details, details) . . . 025/1522 PAYCOM: OK, we suggest DEF because of GHI. I'll go to POD.		Chat: Title of Specific Conversation (Distribution)		

Unified interface for multiple communication tools

Text chat complements/augments voice loop discussions

Opportunity to significantly improve voice loop management

Developed at MSFC Payload Operations Integration Center (POIC)

Takeaway from “Simplify Ops Comm & Log Keeping”

Presentation and Storage

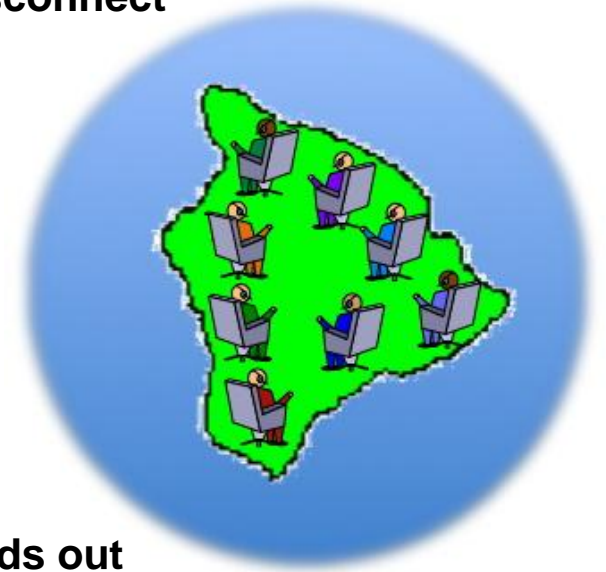
Same instance viewed by multiple parties -> even better sync
Represented in fewer places -> fewer opportunities for disconnect
Discoverable when needed, invisible when not

Text conversations within logs or as linked adjuncts

Excellent retention, organization and visual persistence
Relieve load on voice loops

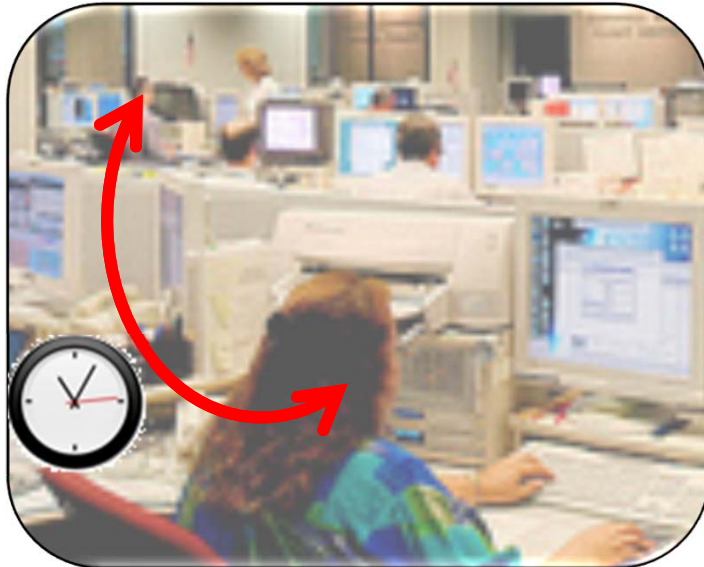
Voice communication

Less "clobbering" and talk-over -> important content stands out clearly



A Critical Concept

Voice

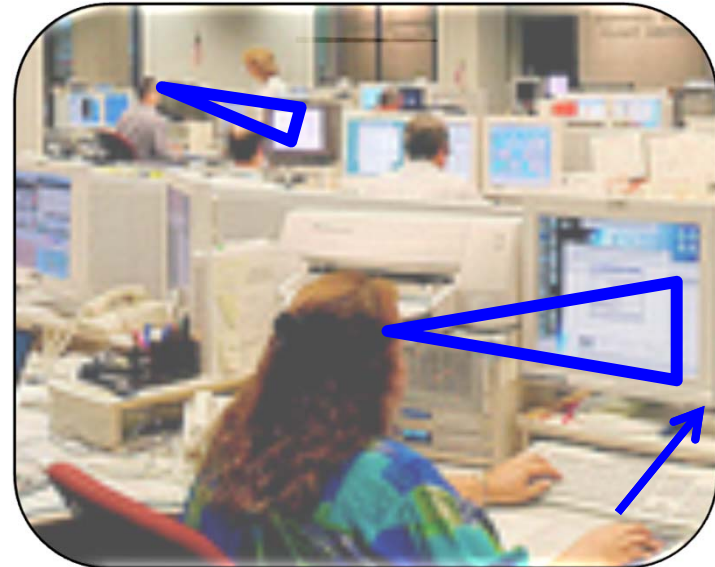


Serial

Fluid and quick
Expressive and humanizing

Fleeting – “Say again?”

Text/Graphics



Semi-Parallel / Parallel

Visually persistent
Easy to review; linkable

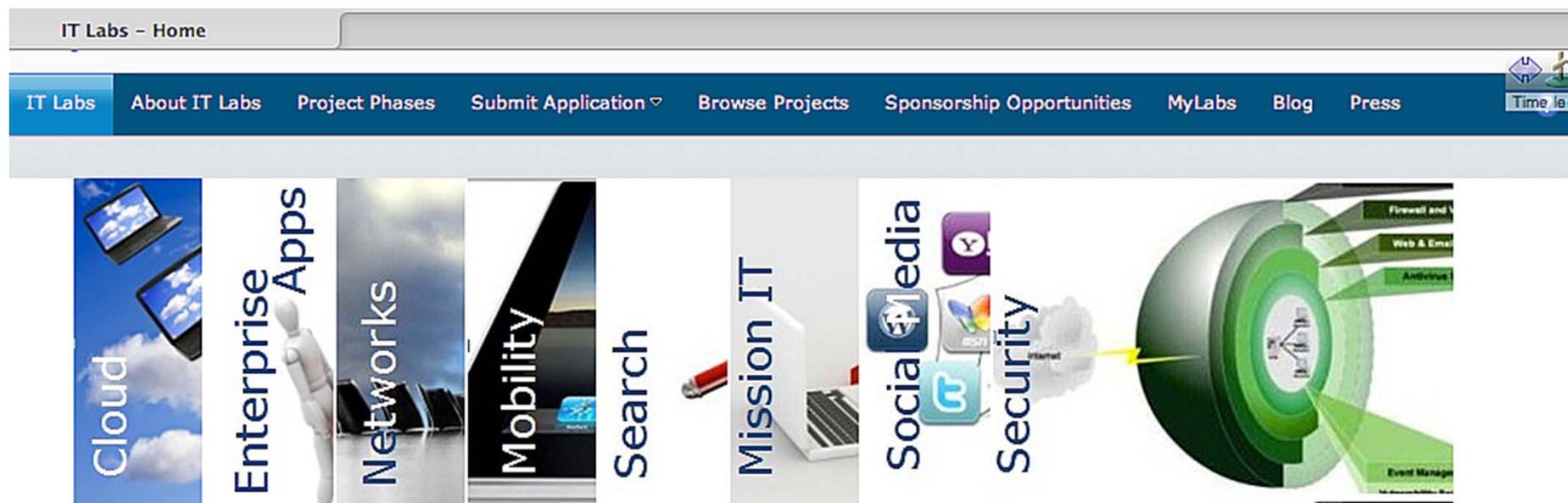
Slower to create than voice

NASA IT Labs

HQ activity sponsoring small, innovative IT projects

Good place to shop for ideas, developers, and sponsorship

<https://labs.nasa.gov> (need to be inside NASA firewall)



EXPLORE.COMMENT.ENGAGE.LEARN.EDUCATE.CREATE.CONSTRUCT.PIONEER.SHARE.CONNECT.

IT Labs is the Technology and Innovation Division of NASA's CTO-IT in the Office of the Chief Information Officer (OCIO). We are committed to empowering NASA's scientists and engineers with the most innovative information technology in the world.

The annual **IT Labs Project Call** for FY 2013 is **4 February - 21 March**. Preview the **Project Call Timeline** and prepare your innovative ideas to meet the **Project Proposal Evaluation Criteria**.

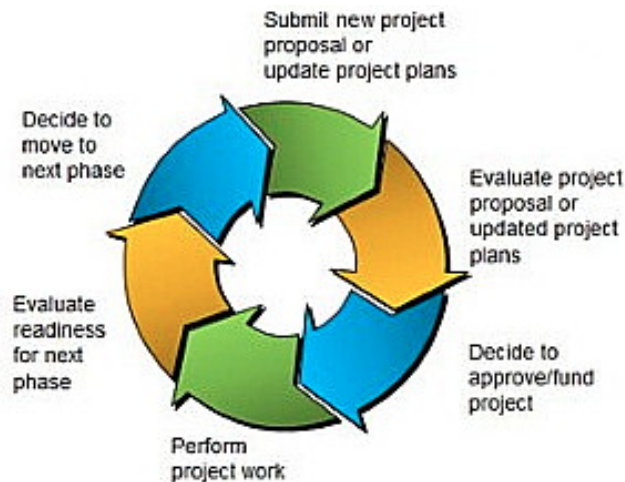


Annual Report
2011 - 2012

IT Labs Project Phases

Each Phase typically 90-120 days, <\$30K

Annual call for new projects Feb-Jun



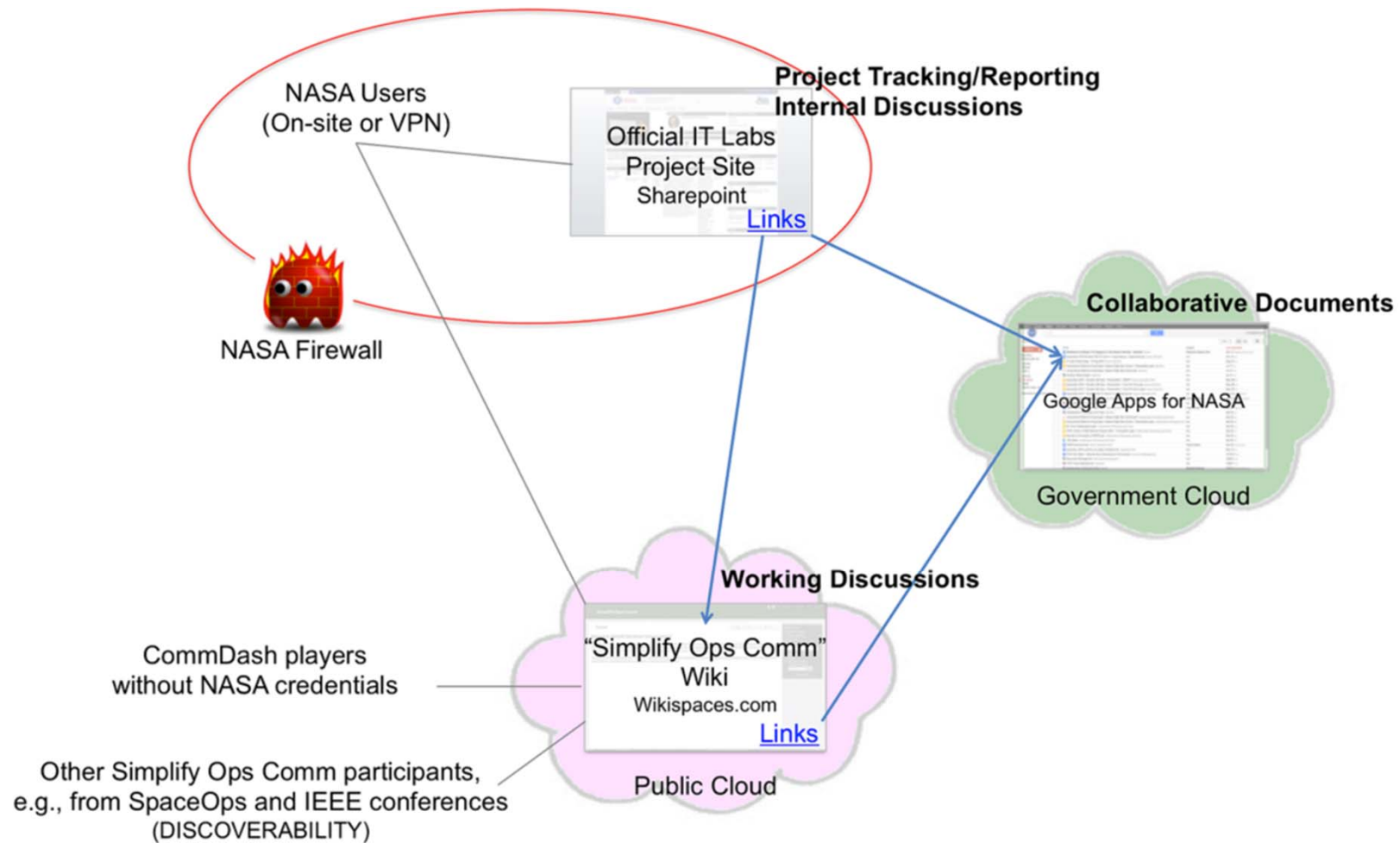
Idea/Issue - Exploration of a capability or technology that has potentially significant value to users

Proof of Concept - A thesis or demonstration to see if the proposed capability would work in the target environment

Prototype - Limited-scope trial, representative of the eventual implementation, aimed at a specific business problem

Pilot - Small-scale implementation of the technology that includes a representative subset of customers and other stakeholders

Collaboration Paths (Crossing the firewall safely)



Migrating wikispace functions to Google Apps

CommDash Functions - User Perspective

Voice traffic related to chat:

- 025/1510 PAYCOM and PSE, POD on POD loop: Could you work situation ABC and summarize on this loop when finished?
 PAYCOM: Wilco – PSE, meet me on PAYCOM chat? PSE: Wilco.
- 025/1525 POD, PAYCOM on POD loop: We've finished working ABC, and recommend DEF because of GHI.
 POD: Thanks, PAYCOM and PSE. I'll discuss with FLIGHT and get back with you.

(Interested parties can review the detailed discussion by viewing the PAYCOM chat channel between 1510 and 1525.)

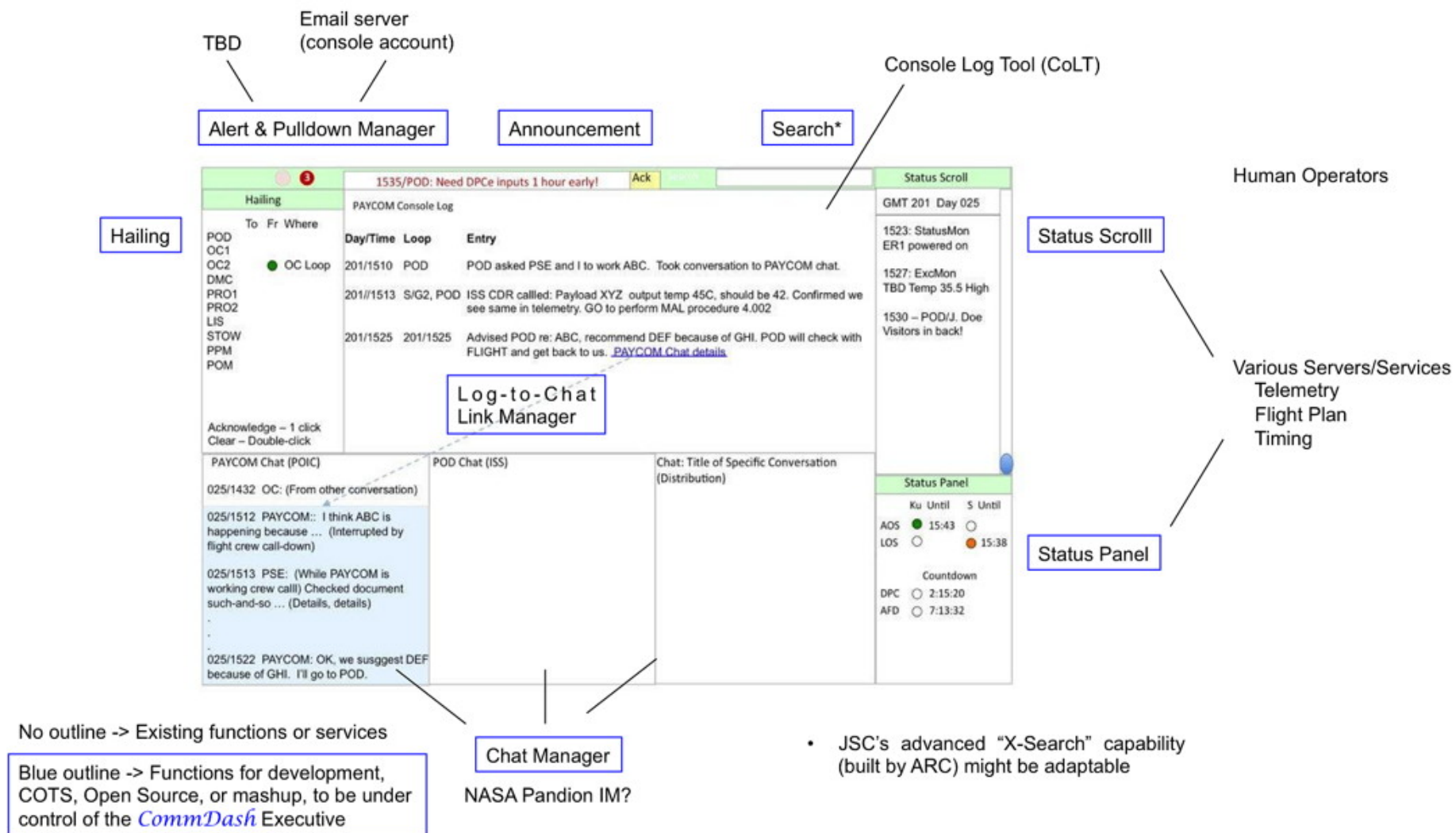
Alerts & Pulldowns, e.g., messages, action items

Major Announcements

Search

<div style="background-color: #f44336; color: white; border-radius: 50%; width: 20px; height: 20px; line-height: 20px; margin: 0 auto;">3</div>	1535/POD: Need DPCe inputs 1 hour early!		<input type="button" value="Ack"/> <input type="button" value="More"/>	Status Scroll															
Hailing	PAYCOM Console Log			GMT 201 Day 025															
<div style="display: flex; justify-content: space-between;"> <div>To</div> <div>Fr</div> <div>Where</div> </div> <div style="margin-top: 5px;"> POD OC1 OC2 ● OC Loop DMC PRO1 PRO2 LIS STOW PPM POM </div>	<div style="text-align: right; margin-bottom: 5px;"> Console Log </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Day/Time</th> <th>Loop</th> <th>Entry</th> </tr> </thead> <tbody> <tr> <td>201/1510</td> <td>POD</td> <td>POD asked PSE and I to work ABC. Took conversation to PAYCOM chat.</td> </tr> <tr> <td>201//1513</td> <td>S/G2, POD</td> <td>ISS CDR called: Payload XYZ output temp 45C, should be 42. Confirmed we see same in telemetry. GO to perform MAL procedure 4.002</td> </tr> <tr> <td>201/1525</td> <td>201/1525</td> <td>Advised POD re: ABC, recommend DEF because of GHI. POD will check with FLIGHT and get back to us. PAYCOM Chat details</td> </tr> </tbody> </table>			Day/Time	Loop	Entry	201/1510	POD	POD asked PSE and I to work ABC. Took conversation to PAYCOM chat.	201//1513	S/G2, POD	ISS CDR called: Payload XYZ output temp 45C, should be 42. Confirmed we see same in telemetry. GO to perform MAL procedure 4.002	201/1525	201/1525	Advised POD re: ABC, recommend DEF because of GHI. POD will check with FLIGHT and get back to us. PAYCOM Chat details	1523: StatusMon ER1 powered on 1527: ExcMon TBD Temp 35.5 High 1530 – POD/J. Doe Visitors in back!			
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Acknowledge – 1 click Clear – Double-click																			
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	Ku	Until	S	Until															
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LOS	○		●	15:38															

CommDash Functions – What to Develop/Mashup



Unique Features (compared to current SNSs) to Develop/Mashup

Frames

Quick control of frame sizes and relative locations



Chat Streams

View multiple streams concurrently

Swap out streams very quickly and simply

Create dedicated streams on the fly

Manage access dynamically

Index streams, e.g., similar to email inbox



Alert & Pulldown Functions

Console email account access

Individual work email access

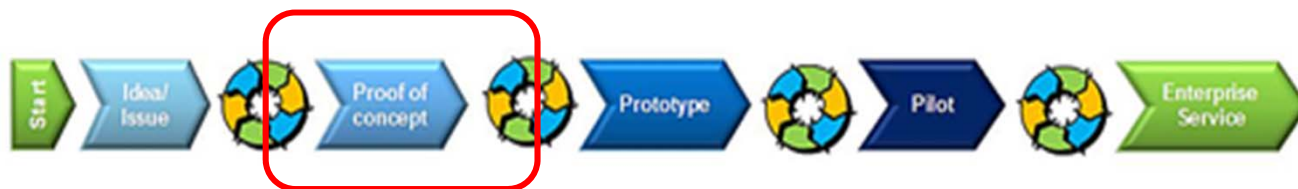
Hailing tailored to specific ops/project environment

User-defined notifications, reminders, etc.



What happens next? Options!

IT Labs Phase 2



eXploration Habitat 2014 Academic Innovation Challenge



You wanna play? Let's talk!

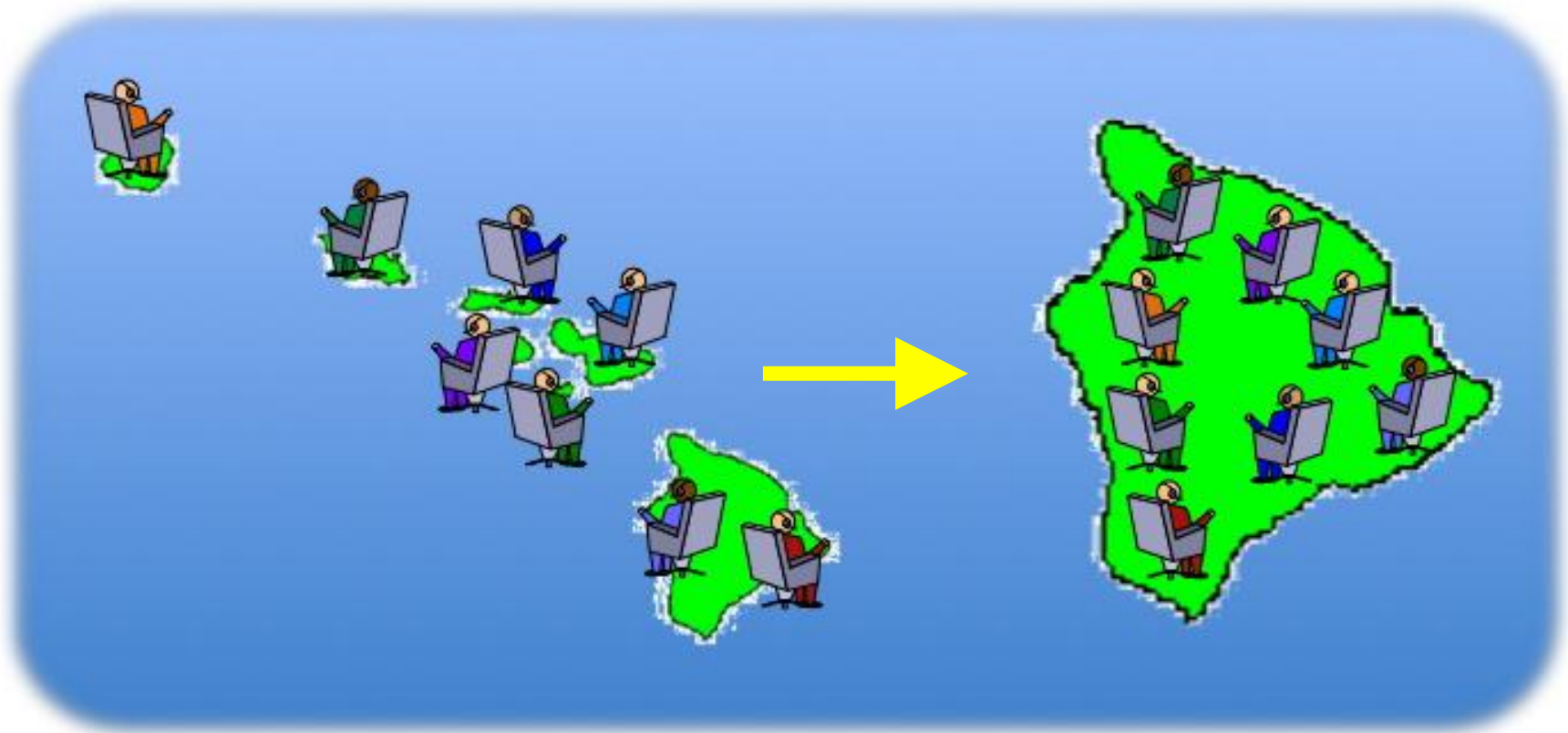


scotty@nasa.gov

256-544-3226

256-227-0339 voice/text

Separate capture scatters. Shared capture gathers.



Aloha!